ISSN: 2637-6067 DOI: 10.6918/IJOSSER.202001_2(11).0006

Curriculum Achievement Degree on the Advanced Mathematics

Lipu Zhang[1, a], Min Zhao[1, b] and Xiaoping Zhang[1, c]

[1]College of Media Engineering, Communication University of Zhejiang, Hangzhou, 310018, China.

[a]zhanglipu@cuz.edu.cn, [b]cuzmath@126.com, [c]20040199@cuz.edu.cn

Abstract

In this paper, based on the engineering accreditation system, we use the advanced mathematics in Communication University of Zhejiang as an example, to testify the method for the evaluation of curriculum achievement degree. The result shows that the comprehensive application ability is the most important issues, which should be taken more focus on.

Keywords

Engineering accreditation, advanced mathematics, curriculum achievement degree.

1. Introduction

In 2018, the Engineering Accreditation (EA) was launched in the Communication University of Zhejiang (CUZ). After much deliberation, three majors were selected to submit the application, i.e., Network Engineering, Radio and Television Engineering, and Electronic and Information Engineering, respectively. Following the guideline of EA, the total scores of mathematics and physics should take at least 15%, that is about 24 scores in total. As for the advanced mathematics, which is started at the first semester and finished in the second semester, the scores are 5 and 5.5, respectively. Comparing all the curriculums in the three majors, the advanced mathematics take the most important role, from the score aspect for one single course. That is why the curriculum achievement degree (CAD) of advanced mathematics is the most important. Motivated by this situation, we select Advanced Mathematics as an example to analyze the CAD, by which can provide a reference for the other courses.

The paper is organized in four sections. For the second section, we introduce the curriculum evaluation system for advanced mathematics. The third section is about curriculum achievement degree (CAD) of advanced mathematics. The fourth fifth section is some remarks.

2. Curriculum Evaluation System

In the teaching of advanced mathematics, to judge one student's achievement, the teacher shall not only take care of the class performance, but also pay attention to the afterschool study. To evaluation the student's CAD, the following 2 index should be included.

(1) Curriculum Achievement index (CAI): the degree of course goals fulfillment;

(2) Graduation Requirement index (GRI): the degree for the graduation requirement.

For the advanced mathematics, it has three goals, which are

(a) Be able to apply mathematics, natural science, engineering fundamentals and professional knowledge to solve complex engineering problems;

(b) Be able to apply the basic principles of mathematics, natural science and Engineering Science, identify, express, and analyze complex engineering problems through literature research to obtain effective conclusions.

ISSN: 2637-6067 DOI: 10.6918/IJOSSER.202001_2(11).0006

(c) Have the consciousness of independent learning and lifelong learning, and the ability of continuous learning and adaptive development.

The content of course evaluation includes: Theoretical basis (TB), Calculation basis (CB), Computation synthesis (CS), Comprehensive application (CA), Usual performance (UP), Mid-term test (MT) and Final exam results (FER).

Table 1. The raw data from course evaluation

	Content of course evaluation	TB	CB	CS	CA	UP	MT	FER
Basic data of course evaluation	Average score of students	9.3	7.8	39.6	16.5	92	72	73.2
	Target score	15	15	50	20	100	100	100

From table 1, we can obtain all the needed data for course evaluation. In what follows, we will calculate CAI based on the given data.

The CAI for each course goals can be calculated from the following formulation.

$$CAI = \sum_{TB,CB,CS,CA} Weight \times Averagescore \tag{1}$$

By equation (1), we can obtain the CAI results of Table 2.

Table 2. The CAI results

Course Goals	Evaluation content	Weight	Average score	CAI
a	TB	0.3	62	0.735
	CB	0.3	52	
	CS	0.3	79.2	
	CA	0.1	82.5	
b	TB	0.2	62	0.714
	CB	0.2	52	
	CS	0.3	79.2	
	CA	0.3	82.5	
c	TB	0.2	62	0.716
	CB	0.2	52	
	CS	0.2	79.2	
	CA	0.2	82.5	
	UP	0.1	92	
	MT	0.1	72	

ISSN: 2637-6067 DOI: 10.6918/IJOSSER.202001_2(11).0006

The graduation requirements include four aspects

(d) Be able to apply mathematics, natural science, engineering foundation and professional knowledge to the expression of complex radio and television engineering problems;

(e) Master the fundamentals of mathematics, natural science and radio and television engineering, and be able to apply them to the analysis of complex engineering problems;

(f) Be able to establish appropriate mathematical model for specific radio and television engineering problems, and use appropriate mathematical tools to solve them;

(g) Be able to use professional knowledge and mathematical model to improve and optimize the performance and efficiency of radio and television system.

The GRI for each graduation requirement can be calculated from the following formulation.

$$GRI = \sum Weight \times CAI \tag{2}$$

Table 3. The GRI results

Graduation Requirements	CAI Course Goals	Weight	CAI
d	a	0.6	0.727
	b	0.4	
e	a	0.4	0.723
	b	0.6	
f	a	0.3	0.721
	b	0.3	
	c	0.4	
g	a	0.2	0.720
	b	0.2	
	c	0.6	

3. Curriculum Achievement Degree

In Section 2, we have obtained the CAI for each graduation requirements. Now we give the CAD for the advanced mathematics.

The equation for calculation of CAD from the CAI is

$$CAD = \left(\sum_{d,e,f,g} Weight \times CAI \right) / 4 \tag{3}$$

By equation (3), we obtain the curriculum achievement degree for advanced mathematics is 0.723.

ISSN: 2637-6067 DOI: 10.6918/IJOSSER.202001_2(11).0006

Acknowledgements

This paper was financially supported by the Educational reform project of Communication University of Zhejiang: Research on the mixed teaching mode and content of mathematical modeling.

References

[1] James J S. Science, Technology, Engineering, and Mathematics (STEM) Curriculum and Seventh Grade Mathematics and Science Achievement.[J]. 2014

[2] Powell T L. A comparative analysis of the Singapore Math curriculum and the Everyday Mathematics curriculum on fifth grade achievement in a Large Northeastern Urban Public School District[J]. 2014.

[3] Brown J W. The effect of a computer-supported curriculum on student beliefs about mathematics and mathematics achievement[M]. 1995.